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SECURITY INFORMATION
CENTRAL INTELLIGENCE AGENCY
INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT

CD NO.

COUNTRY USSR
SUBJECT Economic - Petroleum
Transportation - Rail, water
HOW PUBLISHED Book
WHERE PUBLISHED Moscow
DATE PUBLISHED 1941
LANGUAGE Russian

DATE OF INFORMATION 1913 - 1940

DATE DIST. 27 Feb 1952

NO. OF PAGES 5

SUPPLEMENT TO
REPORT NO.

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Organizatsiya Perevozok Nalivnykh Gruzov na Zheleznodorozhnom
Transporte (Hauling Liquid Freight by Railroad Transport)
Gostranszheldorizdat, Moscow, 1941.

HAULING PETROLEUM ON SOVIET RAILROADS AND WATERWAYS

WATER TRANSPORT

As most of the petroleum extracting and refining bases of the USSR are lo-
cated As of 1941 in Baku, water transport is one of the principal carriers of
petroleum. The main water routes for hauling this freight are:

Baku - Krasnovodsk. Petroleum products destined for Central Asia and the
East follow this route. They go to Krasnovodsk by water and then by rail to
the final destination.

Baku - Makhach-kala. Petroleum products are shipped from Baku to Makhach-
kala by water, relieving the railroads of a 350-kilometer haul. From there,
railroads carry them to the central regions of the USSR and pipelines are used
to carry them to other consumers.

Baku - Astrakhan' and along the Volga. The main flow of petroleum products
follows this route to petroleum refineries and transshipping points. In 1937,
6.1 million tons of petroleum were shipped along this route. Of this amount,
73.8 percent was transferred to railroad for shipping to the Volga region, the
Urals, and Siberia, and the remaining 26.2 percent was shipped directly to ports
along the Volga where it was transhipped directly to consumers.

Batumi - Odessa. Petroleum products destined for southwestern regions of
the USSR follow this route.

In the USSR, river tankers have a freight-carrying capacity of 750-800
tons, while barges carry from 1,000 to 10,000 tons. Maritime tankers have a
capacity of 9,000-10,000 tons.

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RAILROAD TRANSPORT

The main freight flow of petroleum, which constitutes about 5 percent of the freight turnover on USSR railroads, originates in Baku, Groznyy, and in water-rail transshipping points such as Odessa, Krasnovodsk, Makhachkala, Stalingrad, and Saratov.

Efficient operation and location of loading and unloading stations are very important in the rational utilization of railroads for hauling petroleum. In 1939, there were 2,810 stations shipping petroleum freight in the USSR. Of them, 95.4 percent shipped under 5,000 tons annually and only three stations shipped more than 2 million tons a year. In the same year, 4,478 stations unloaded petroleum.

Locating petroleum refineries near the oil wells or at water shipping bases considerably lightens the load of the railroads. The construction of petroleum refineries in such places relieved the railroads of hauling 12.5 million tons of crude petroleum in 1937 thus decreasing hauling requirements 4.7 billion ton-kilometers a year.

Soviet plants started to turn out four-axle, 50-cubic-meter tank cars after 1917, and, no small-capacity (12, 14, 16, or 18 ton) cars are now being produced. At present, 250 different types of tank cars are being made. Of these types, the four-axle tank car of the Plant imeni Marti (type 4) is most suitable for Soviet railroad transport.

Nine tables giving data on petroleum hauling between 1913 and 1940 follow.

Table 1. Relative Importance of Different Types of Transport
for Hauling Petroleum (in percent of total)

<u>Year</u>	<u>Water Transport</u>	<u>Railroad Transport</u>	<u>Pipeline</u>	<u>Total</u>
1913	63.3	34.5	2.2	100
1930	45.2	42.1	2.4	100
1932	44.2	43.0	12.8	100
1937	43.1	42.4	14.5	100

Table 2. Relative Importance of Petroleum Hauling on Soviet
Railroads (in percent of total freight hauled)

1913	4.4
1928	5.6
1939	5.4
1940 (11 months)	5.1

Table 3. Relative Importance of Petroleum Hauling on Soviet
Waterways (in percent of total freight hauled)

1928	26.2
1932	15.3
1937	11.6

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Table 4. Average Length of Haul of Petroleum on USSR Railroads
(in kilometers)

1913	601
1928	728
1938	1,263
1939	1,178
1940	1,228

Table 5. Average Length of Haul of Petroleum on Soviet Waterways
(in kilometers)

1913	867
1932	534
1937	494

Table 6. Hauling Petroleum by Railroad From Various Regions

Regions	1913		1932		1937	
	Mil- lion Tons	Per- cent	Mil- lion Tons	Per- cent	Mil- lion Tons	Per- cent
Central regions	1.0	31.1	1.3	7.7	1.0	4.0
Regions of North Caucasus	1.2	20.9	7.3	42.9	8.7	35.5
Regions of Lower Volga and Volga- Vyatka	1.5	25.8	2.4	14.1	3.4	13.8
Ural regions	0.1	1.7	0.4	2.4	1.5	6.0
Far East	--	--	0.1	0.6	0.4	1.6
Ukrainian SSR	0.1	1.7	1.3	7.6	3.8	15.3
Transcaucasus republics	1.0	17.2	3.0	17.6	3.8	15.3
Central Asian republics	0.1	1.7	1.2	7.1	2.1	8.5
Total	5.9	100	17.0	100	24.7	100

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Table 7. Interregional Hauling of Petroleum Products by Railroad in 1937
(in million tons)

Shipping Regions (Railroad)	Regions of Destination								
	Northwest	Central	Volga-Vyatka	Lower Volga	Urals	West Siberia	East Siberia	Far East	Ukraine
Transcaucasus Railroad System imeni L. P. Beriya	0.1	0.2	--	0.1	--	--	--	--	0.4
Ordzhonikidze and imeni Vo- roshilov rail- road systems	0.3	1.4	0.3	0.5	0.3	0.1	0.1	0.1	0.2
Central Asia	--	--	0.1	--	--	--	--	0.3	--
Lower Volga	0.1	0.7	0.3	--	0.7	0.4	0.1	0.1	--
Upper Volga	--	0.1	--	--	--	--	--	--	--
Urals	--	--	--	--	--	0.1	--	--	--
Southwest (Odessa)	0.8	0.5	--	--	--	--	--	--	--
Donbass	0.1	0.2	0.1	--	--	--	--	--	--

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Table 8. Petroleum Tonnage Hauled on Caspian and Black Seas
(in 1,000 tons)

Year	Caspian Sea	Black Sea
1931	7,513	1,078
1932	8,214	1,314
1933	9,233	1,457
1934	11,744	2,264
1935	12,149	2,834
1936	12,711	3,425
1937	14,073	3,635
1938	15,200	4,700

Table 9. Cost of Hauling Petroleum by Soviet Transport

Petroleum Product and Type of Transport	Operational Expenses		Capital Investment		Metal Consumption	
	Kopeks per Ton-Km	Index	Kopeks per Ton-Km	Index	Kopeks per Ton-Km	Index
<u>Heavy Petroleum</u>						
River transport	0.1380	100	1.708	100	8.61	100
Pipeline	0.630	290	1.450	271	33.50	445
Railroad	0.254	605	3.000	174	55.70	643
<u>Light Petroleum</u>						
River transport	0.2185	100	3.156	100	23.74	100
Pipeline	0.2050	143	1.000	104	36.30	127
Railroad	0.811	393	1.000	85	55.70	194
<u>Gasoline</u>						
River transport	0.1106	100	1.403	100	9.61	100
Pipeline	0.3019	58	3.920	110	36.70	124
Railroad	0.3722	317	3.320	95.5	57.00	193

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